# RADIOCOMMUNICATION FIELD HANDBOOK

## British Columbia Forest Service
## Radio Operations

# Ministry of Forests

April 2004

105-07232/



## QUICK REFERENCE - WHERE TO GET HELP (More Appendix F)

| CONTACT | OFFICE | Cell / Pager | Radio Call Sign |
|---|---|---|---|
| **RADIO OPERATIONS - Victoria (343B Bay Street)** | | | |
| Barry Cowan | 387-6659 | 686-2436 | 4W7 |
| Dwayne Harris | 387-6662 | 686-2435 | 4W3 |
| Ed Machtmes | 387-6661 | 686-2434 | 4W4 |
| Jim Riddell | 387-6658 | 686-2437 | 4W2 |
| Dave Miller* | 387-3500 | /388-1100 | 4W5 |
| Phil Bulled* | 387-6358 | | 4W8 |
| Shop: Cell Phone | | 361-5042 | |
| Shop: Pager | | /413-1421 | |
| **COAST FOREST REGION** | | | |
| **Nanaimo (2100 Labieux Road)** | | | |
| Fred Cleland* | 751-7173 | 668-0640 | 30 |
| Lee Chase | 751 7084 | 741 6378 | 32C |
| Cezar Fador | 751-7174 | 741-6334 | 32A |
| Mike Pepin | 751-7175 | 741-6333 | 32B |
| **NORTHERN INTERIOR FOREST REGION** | | | |
| **Prince George (3980-22nd. Avenue)** | | | |
| Don Lewis* | 565-6848 | 612-7823 | Car41 |
| Eric Arsenault | 565-6028 | 613-8488 | Car44 |
| **Smithers (3333 Tatlow Road)** | | | |
| Harold Langille | 847-6332 | 877-1132 | Car42 |
| Bill English | 847-6333 | 877-1184 | Car45 |
| **Charlie Lake (Dave Johnson Bldg. - Mile 52.2 Alaska Hwy.)** | | | |
| Don Anderson | 262-3331 | 262-8421 | Car43 |
| **SOUTHERN INTERIOR FOREST REGION** | | | |
| **Kamloops (810 - 6th Avenue)** | | | |
| Betty Corbin-Charman* | 828-4095 | | Car90A |
| Rowe Barnett* | 828-4561 | 318-2492 | 44E |
| Dave Bustin | 828-4945 | 851-1740 | Car60 |
| Glenn Allen | 828-4560 | 371-1283 | Car90 |
| **Williams Lake (1010A Mackenzie Avenue North)** | | | |
| Grant Oliver | 398-4460 | 398-0758 | 44E3 |
| **Nelson (1907 Ridgewood Road)** | | | |
| Mark Tack | 825 1121 | 354-3311 | Car95 |
| **Cranbrook (1902 Theatre Road)** | | | |
| Randy Miller | 426-1757 | 489-9787 | Car97 |

**Notes:** * Supervisor

**Important:** Protection Duty Officer (Fire season only) and, The Provincial Radio Communications Officer *(New for 2004)*

Fire related, and other radio communications equipment problems need to be passed on to the Protection Duty Officer or the Provincial Radio Communications Officer (Provincial Radio Operations) as soon as they occur.

The Provincial Radio Communications Officer is a Radio Technician or Radio Supervisor and is assigned at the time an Incident Fire occurs. This person is responsible for implementing and coordinating radio communications for Incident Fires throughout the province, for the coordination of radio communications between Regional and Zone Fire Centers and ensures the Fire Commissioner's channel is available on interface fires.

**Headquarters' Radio Operations Radio Tech Support Staff:**

Ministry of Forests, Radio Operations
Mailing Address: 343B Bay Street, Victoria, BC, V8W 3E7
Courier Address: 343B Bay Street, Victoria, BC, V8T 1P5

| Radio Shop Victoria | Contact | Phone No. |
|---|---|---|
| Radio Technician | Dwayne Harris | 250-387-6662 |
| Radio Technician | Ed Machtmes | 250-387-6661 |
| Radio Technician | Barry Cowan | 250-387-6659 |

**Prepared By: Ministry of Forests – Radio Operations**

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## THE B. C. FOREST SERVICE RADIO SYSTEM:

The Ministry of Forests or British Columbia Forest Service (BCFS) radio system is comprised of twenty-nine separate district systems in three regions, weather monitoring stations and an aircraft location and management system. The BCFS system is one of the largest systems in Canada - it includes base stations, mountain top repeaters, mobile units for vehicles, aircraft, and marine vessels, and handheld portable units for individual communication needs. The primary focus of the radio system design has been to provide reliable two-way radio service to personnel required to operate in the rural and remote locations of British Columbia, and to provide emergency radio communications where and when required.

Remember, the BCFS radio system operates like a party line phone – ALWAYS ASSUME OTHERS ARE LISTENING.

Instructions within this handbook will focus on:
**Use of the BCFS radio system;**
**Information needed to use radios effectively;**

## AUTHORIZATION - INDUSTRY CANADA:

***Licensing***

All Ministry radios are licensed. This task is handled by the Victoria IMG branch, Radio Operations.

***Regulations***

1. You shall not deliberately cause harmful interference to another user.
2. Do not transmit signals not related to work or safety. Unless a transmission is related to official business or safety it should be deemed *Not-Relevant*.
3. You may not transmit a message (conversation) containing profane or obscene words or language.
4. You may not divulge or use information you may overhear - other than from a public broadcast.
5. Emergency transmissions have priority over all other communications!

## VHF Handheld and Mobile Radios:

Handheld portable radios and mobile radios are used for person-to-person communications either **directly** or through a **radio repeater.** Direct radio-to-radio (simplex) channels are identified by a **metallic** colour. Repeater (duplex) channels are identified by a **rainbow** colour. (See appendix E for more information on Radio

Repeaters).
See Appendix C for standard Forest Service channel frequencies.

**Range:**
The range of VHF radio depends on a number of factors including transmit power, antenna efficiency, terrain and distance. Treat direct radio-to-radio communications as "***line of sight***". Intervening terrain such as hills or mountains will block your signals unless the distance between radios is very short. The "rubber ducky" antenna on portables is notoriously inefficient. Maximize its limited range by keeping the antenna **vertical**.

## OPERATING PROCEDURES:

(Things to know before you start)

1. You must have a call sign
2. The call sign by which your station (you) will be known, also the call sign(s) of the stations with which you wish to communicate. To obtain a call sign – see Appendix F
3. The safety check-in schedule that you are required to keep. If you are not sure, check with the district office or your supervisor.
4. The channel designation and tone (switch number on the radio) for the frequency(s) you will be using to communicate with a given station, from your area of operation.
5. How to operate the equipment – see "Forest Service Radios" starting page 10.
6. Is the radio working? Perform a 'Radio Check' *before* leaving for the field.
7. Are you within range (line of sight) with the repeater you are trying to use?

***Remember:*** *You may know where you are* ***but...*** *does the person with whom you are 'checking- in' know where you are and that you are safe?*

**Tone of Voice, Voice Loudness and Articulation:**
***Do Not Shout:*** Shouting may cause the radio to clip words rendering them indistinguishable at the receive station. You are better to speak normally or a bit softer if someone says they can not understand you. Articulate your words.

**Squelch Control:**
The purpose of the squelch control is to quiet the noise that radios generate when not receiving a signal.

All BCFS radios have a squelch control however this control is not always accessible to the operator. Those radios with internal squelch control will have been pre-set by a radio technician. Some manufacturers combine the 'on/off switch, squelch control and the volume control as one switch.

**MICROPHONE:** Hold front of the microphone 5 cm from your mouth and speak into it with a normal voice tone and audio level.

**CTCSS (Continuous Tone Coded Squelch System)**

The Ministry uses CTCSS to reduce interference on the district repeater systems. CTCSS is a sub-audible tone (which cannot be heard by users) placed on each radio repeater transmission. The correct tone tells the receiving radio that a message is coming through. Unless the correct tone is present, you will not be able to talk through a repeater, and if your radio is incorrectly coded, you will not be able to communicate through a repeater. (Note: The west side of Northern Interior Forest Region will see CTCSS implemented in 2004-2005.

***District CTCSS Tones***

A radio 'Toned' for one District's radio system is not likely to work in another district.

See Appendix A for District System Tone Frequencies.

The Radio Repeater Maps (Updated each year) show the specific district tones. These maps are located on the ministry intranet site at http://gww.for.gov.bc.ca/his/radio/repeatersites.htm.

***Provincial CTCSS Tone – (Being phased out in 2005)***

A provincially 'Toned' radio will work wherever there is repeater coverage without the need to change tones however, to prevent harmful interference to adjacent district systems its use should be a last resource for emergency purposes.

***Aircraft use of CTCSS tones***

All aircraft are to use district tones except in an emergency.

## LOGGING ROADS

**ROAD SAFETY IS OF PRIME CONCERN TO THE MINISTRY**

**Personnel operating vehicles on logging roads must have their vehicle equipped with a mobile radio programmed with the required logging channels for the area in which they are operating.**
**For safety purposes the vehicle mobile must be used for KM checks - handheld portable radios must not be used for in-vehicle road channel communications on logging roads.**

**Entering and Working in an Active Logging Area:**

***Road Channel Frequency Check:***

Check your radio / frequency list and switch to the frequency that is posted at the entrance to the active logging road.

Confirm your selection by calling someone before you enter the road. It is important to be familiar with the calling procedures used on that road. You must "*clear the road*" when you leave the radio advisory portion of the road. Listen carefully to all traffic you hear. Shut off all other radios and limit conversations.

If you must make a call on a channel other than the road channel you are on:

***Prior to switching channels:***

1) Advise others that you are stopping and where you are stopping;
2) Stop your vehicle in a visible location out of the way of any passing vehicles;
3) Switch to your alternate channel and make your call;
4) Upon completion of the transmission on the alternate channel, switch back to the Logging Road Channel. (**Note:** This must be monitored and checked for logging frequency traffic and logging truck movement prior to proceeding.

**Important**:

- Make sure you are on the correct channel. If you do not know the frequency used in an active logging area then DO NOT enter this area. Contact the District Office for information on the frequency used on that road.
- Road Channels are not to be scanned.
- Road Channels are not to be used outside their designated areas of operation.

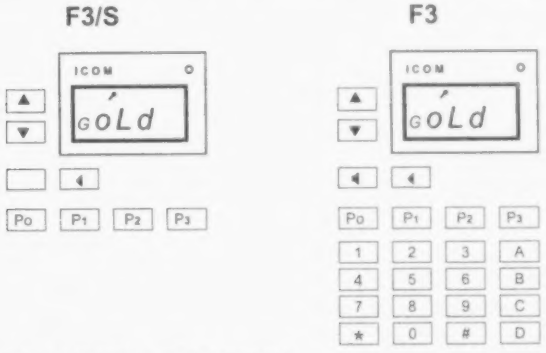
## BC FOREST SERVICE RADIOS

**Main Types and Models of Field Staff Radios:**

- Handhelds: (Portables)
  ICOM: F30GT (Current Ministry Standard)
- ICOM: F3 and F3s
  Kenwood: TK280
- Mobiles: (In Vehicles)
  Kenwood: TK780 (Current Ministry Standard)
  Kenwood: TK730
  ICOM: F1020 and F521

## ICOM F3 AND F3s INSTRUCTIONS:

Note: the following is representative of all F3 and F3s radios used within the Ministry of Forests. The way the function buttons are programmed is now standard from Region to Region.




▲/▼ CHANNEL UP/DOWN

**– OR ◀ BANK UP/DOWN**

Radio channels are divided into two banks of 16 channels.

◀ NOT USED

**P0** CTCSS TONE ENTRY

Press **PO** to enable tone select. Use the **Up/Down** buttons to select the tone, then press **PO** again to resume operation on the selected tone. The same tone will be applied to **ALL** channels. If radio does not appear to transmit on repeater channels, press **PO** and use the up/down buttons to select CtCH-mR (default tone), then press **PO** to return to normal operation, and try the radio again. All Victoria Fire Stock Radios have only transmit tone available, no receive tones.

**P1** HIGH/LOW

To conserve battery life sets transmitter to High or Low power.

**P2** High / Low power output

**P3** Keypad Lock

**A, B, C, D** Not programmed for Fire Stock radios.

**The above operation is representative of all Fire Stock F3s radios.**

## ICOM F30GT INSTRUCTIONS:

# Icom IC-F30GT

### Key Assignments and Operation

**Rotary Selector Switch:** Selects channel bank. Bank number is shown at the top of the display and on the rotary switch. The selected bank name is displayed momentarily when the bank is changed or when the radio is turned on.

**Channel Select:** Use the F2 Up and F3 Down keys to select the channel within the bank. Channels within the bank can be directly entered from the keypad using three digits. (001 for channel 1) Channel number is always shown on the display.

**Fo: Squelch Adjust or Frequency Display.** Press Fo for one second and use the Up/Down keys F1 and F2 to set the squelch from 0-255. (The radio will unsquelch below about 72 and will squelch again above about 90.) Press Fo for one second again to resume normal operation. This key can be optionally set to display receive frequency momentarliy when pressed.

**F1: Scan Start/Stop and Scan Group Select.** Press momentarily to start or stop scan. Press for one second and use the Up/Down keys to select any of the 10 scan groups. (Any channel, from any bank, can be added to, or deleted from a group using the P1 key.) Press F1 again to return to normal operation.

**F2: Up key.** For channel, CTCSS tone, squelch setting or scan group.

**F3: Down key.** For channel, CTCSS tone, squelch setting, or scan group.

**Po: User CTCSS setting.** Press Po and use the up down keys to select CTCSS tone. Press Po again to resume operation on the new tone. Only one channel is changed at a time, and tone remains until changed again. The tone is indicated in the display as Ton XX. Tone MR is tone off, or carrier squelch, and is indicated on the display as Ton --.

**P1: Scan Add/Delete.** After selecting the scan group with the F1 key, press to toggle between Scan On and Scan Off for desired scan channels.

**P2: High/Low Power.** Press to toggle between Low1, Low2 and High power. Low1 and Low2 settings will be indicated by a Low indication at the top of the display.

**P3: Keyboard Lock.** Press to lock all keys. Press again to unlock. A key will show up on the top of the display in Lock mode.

## KENWOOD TK-730 INSTRUCTIONS:

*(No Picture)*

Operation:

The Kenwood TK-730 is a 160 channel radio with 10 groups of 16 channels. The main controls on the front panel are **POWER**, **GRP** (Group Up/Down), **VOL** (Volume), **CH** (Channel Select), **MON** (Monitor), and **SCN** (Scan). There are also 4 programmable keys on the panel.

Channel Selection:

1. The channel group is selected with the Group Up/Down keys to the left of the display.
2. The Channel Selector knob selects channels within the group.

Display:

1. Using the AN switch changes the 13 segment display between alphanumeric and channel display. (The AN key is a programmable key.)
2. To change from alphanumeric display to channel display, press the AN switch momentarily. A confirmation tone sounds, and the alphanumeric display changes to the channel display. The channel display shows both the group number and the channel number.

3. If the AN switch is pressed momentarily again, a confirmation tone sounds, and the channel display changes back to the alphanumeric display.

Squelch Operation:

1. The squelch is set in 16 levels.
2. To set the squelch push the SQL button and using the Channel Selector select the squelch level as code 1 to code 16, with 16 being the highest.
3. The radio will be un-squelched at levels below Code 7.
4. Press the SQL key again to return to normal display.

Monitor Switch (MON):

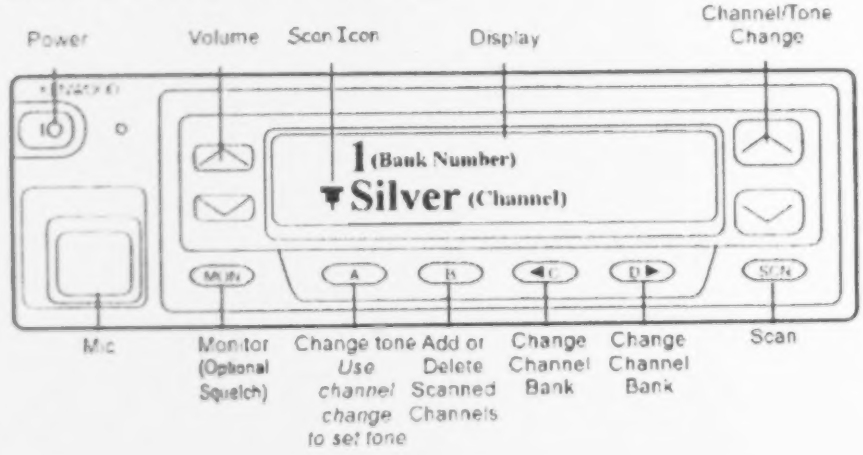
1. If the Monitor switch is pressed momentarily, the receiver CTCSS is disabled. "MON" will be shown on the display. Pressing the Monitor switch again momentarily enables the CTCSS and "MON" disappears from the display.
2. If the Monitor switch is pressed for 2 seconds, the receive CTCSS is disabled and the radio is un-squelched. "MON" and "BUSY" will be shown in the display.
3. Pressing the Monitor switch momentarily three more times restores normal operation.

Scanning:

*(Scanning should be disabled on an active logging roads)*

1. To start the scan, the microphone must be hung up. Press the SCN key. A confirmation tone will sound at the start of scan.
2. Press the SQL key again and a confirmation tone will again sound, and scanning will stop.
3. Picking up the microphone also stops the scan.
4. A D/A switch may be programmed, which allows channels to be deleted or added to the scan. This is optional.

**KENWOOD TK780 INSTRUCTIONS:**



The Kenwood TK780 is capable of 250 channels, arranged in up to 250 groups or banks. There is no external squelch control.

Power on/off:
Press to turn the radio on/off.

Channel Selection:

1. The channel is selected with the "up" or "down" keys to the right of the display.
2. The "C" and "D" keys below the display select bank up/down.

Other Functions:
MON. The monitor button temporarily disables the receiver squelch and CTCSS filter to allow monitoring of all signals on that channel or test receiver volume.

A. To change the tone on the selected channel press the "A" button, then use the channel up/down buttons to select the desired tone. Complete the action by pressing the "A" button again.

B. Press this button to add or delete the selected channel from the scan list. Channels included in the scan will display a down arrow in front of the channel name.

SCAN. Starts or stops the scan function. The microphone must be on hook for scan to work.
**Note of Caution: Users must not SCAN road frequencies.**

**ICOM IC-F1020 OPERATING INSTRUCTIONS:**

PO – CHANGE CTCSS TONE – IF THE RADIO IS CAPABLE
P1 – SCAN START / STOP
P2 – BANK SELECT
P3 – MONITOR/SQUELCH

TO SELECT A CHANNEL – use the Channel Up/Down buttons to select the channel. Use P2 and the Up/Down buttons to select a bank. Bank number is shown on the display. If the arrow is shown above P2, the Up/Down buttons will select banks. Toggle the arrow off to select a channel.

P0 – Push P0 to display the tone, use the Up/Down buttons to change the tone, and push P0 again to enter.

P1 – This activates the scan on Bank 0, when the microphone is hung up.

P2 – Push P2 then the UP/Down buttons to select banks. Push P2 again to exit [bank select] and use the Up/Down buttons for channel selection.

P3 – Pushing P3 will toggle the CTCSS on/off for receive on Bank 1. Speaker on display indicates CTCSS is Off. P3 also momentarily opens the squelch for volume setting.

Use Bank 1 in District and Bank 0 elsewhere in BC if the radio is not capable of changing CTCSS tones.

**ICOM IC-F521 OPERATING INSTRUCTIONS:**

PO – CHANGE CTCSS TONE – FOR ACCESS TO DIFFERENT DISTRICTS
P1 – SCAN START / STOP
P2 – BANK SELECT
P3 – MONITOR/SQUELCH
P4 – SQUELCH ADJUST

P0 – Push P0 to display the tone, use the Up/Down buttons to change the tone, and push P0 again to enter. You may select tones one to nine or 'MR', which is the default tone that has been programmed at the Radio Shop. It is preferable to leave the tone at 'MR' when you are in your home District.

P1 – When the microphone is hung up, this activates the scan on Bank 0.

P2 - TO SELECT A CHANNEL – use the right hand Up/Down buttons to select the channel. Use P2 and the Up/Down buttons to select a bank. Bank number is shown on the display. After selecting the correct Bank, use P2 to toggle the Up/Down buttons back into channel mode.

P3 – Pushing P3 will toggle the CTCSS on/off for receive on Bank 1. Speaker on display indicates CTCSS is off. P3 also momentarily opens the squelch for volume setting.

P4 – Push and hold for one second and the radio will display the squelch level. Use the Up/Down buttons to change the squelch level and then push and hold P4 again to return to operation mode.

## Trouble Shooting / Maintenance and Repair:

***Handheld Radios:***

If you find that the unit does not appear to be receiving or transmitting - Consider and check the following:

1. The Obvious:

Are you on the correct colour (channel) and do you have the correct **tone** for the area in which you are operating.

> **CAUTION - ICOM F3 only:** Changing the tone on one channel changes the tone on **all** the channels

2. Radio Coverage:

You may be out of range of the receiving or transmitting station. If you are using a repeater remember repeater coverage far exceeds that of a 'Handheld'. You may be able to hear the repeater but they can not hear you.

3. Antennas:

Check to make sure the antenna is connected and not broken, ensure the connector is tight. The Rubber Ducky™ antenna (rubber coated) antenna will usually show visible damage. Ensure your antenna is close to a vertical position when transmitting and receiving.

4. Microphones:

If the unit has an external microphone or a "speaker Mic", a break in the microphone cable could be the problem. If a replacement microphone is available - try it, if one is not available remove the speaker Mic and try the radio as stand alone unit.

5 Batteries: (See 'Batteries and Power Sources)

A common problem is weak but not dead batteries. Replace the batteries and try again. If no replacement batteries are available put the radio into low-power mode and try once more.

Also, check for corrosion caused by leaking batteries. Follow the procedure in the section on 'Batteries and Power Sources' on 'Leaking Batteries'.

If you are unsuccessful in getting your radio to work, report the problem to your nearest Regional Technician (see page 2).

## NORTHERN INTERIOR FOREST REGION

**Base Call Signs:**

| Location | Usual Call Sign | Legal Call Sign |
|---|---|---|
| Fort Nelson | Fort Nelson | XMQ85 |

| | | |
|---|---|---|
| Dawson Creek | Dawson Creek | XLT29 |
| Mackenzie | Mackenzie | XLT304 |
| Vanderhoof | Vanderhoof | XLT28 |
| Fort St. James | Fort St. James | XLT85 |
| Prince George | Prince George | XMW65 |
| Burns Lake | | XLT31 |
| Terrace | | XLV67 |
| Smithers | | VBH321 |

## SOUTHERN INTERIOR FOREST REGION

**Base Call Signs:**

| Location | Usual Call Sign | Legal Call Sign |
|---|---|---|
| Williams Lake | Williams Lake | VEC909 |
| Quesnel | Quesnel | XLU72 |
| Alexis Creek | Chilcotin | XLW34 |
| Kamloops | Kamloops | XLT52 |
| Clearwater | Clearwater | XLU29 |
| 100 Mile House | 100 Mile | XLY72 |
| Merritt | Cascades or Merritt | VAQ838 |
| Vernon | Vernon | XLV38 |
| Revelstoke | XLT78 Revelstoke | XLT78 |
| Castlegar | XLW61 Castlegar | XLW61 |
| Cranbrook | XLT82 Cranbrook | XLT82 |
| Nelson | XLU76 Nelson | XLU76 |

## COAST FOREST REGION

**Base Call Signs:**

| Location | Usual Call Sign | Legal Call Sign |
|---|---|---|
| Chilliwack | | XMW348 |
| Squamish | | XLU22 |
| Queen Charlotte | | XLZ63 |
| Campbell River | | XLV60 |
| Port Alberni | XLT40 | XLT40 |

| | | |
|---|---|---|
| Powell River | | XLT33 |
| Port McNeill | | XLY78 |
| Prince Rupert | | XLV65 |

## FIRE CENTRES

**Base Call Signs:**

| Location | Usual Call Sign | Legal Call Sign |
|---|---|---|
| Northwest | | VXC30 |
| Prince George | | XLT26 |
| Cariboo | Cariboo Fire | XMW333 |
| Kamloops | Kamloops Fire Centre | -------- |
| Southeast | Southeast Fire Centre | VXE24 |
| Coastal | Coastal Fire Centre | VDI758 |

# APPENDIX A - RULES OF OPERATION

## MINISTRY ACCESS and USE POLICY

### *General Policy*

The Ministry prohibits the discussion of policy, policy interpretation, or personnel matters over the radio system. If there is any doubt about whether a message should be sent over the radio system, do not send it or discuss it with your supervisor first.

REMEMBER: The BCFS radio system simulates a very large party-line service - many people may be listening into your conversation and you have no way of knowing who they are or which company they may work for.

### *Road Frequency Use Policy*

A *'Road Frequency'* (or Road Channel) is the frequency which must be used on a logging road by an authorized logging operator for use by personnel to carry on day-to-day operations. Logging trucks are required to use this frequency (as defined by WCB regulation Article 26.83 (1)) to advise others in an active logging area of their whereabouts. Other logging road users are required to use this radio channel in compliance with "Forest Service Road Use Regulation" B.C. Reg. 173/95 'Use of 2-way radio'

(WCB) Traffic Control Systems: - Article 26.83 (1)

> **When 2 or more vehicles are using a section of a road which is too narrow to permit them to pass, an effective traffic control system must be used by all vehicles on the road. The traffic control system must include (d) instructional signs, including kilometre and road name/number signs, and the radio frequency for traffic control...**

(Forest Service Road Use Regulation) B.C. Reg. 173/95 - 5 'Use of 2-way radio'

> **A driver on a forest service road who uses a 2-way radio to communicate with other drivers on the road must announce, in accordance with any road markers posted at intervals along the road,**
> **(a) his or her position, and**
> **(b) the branch of the road being traveled, if the radio's signal can be received on more than one adjacent branch of the road.**

To comply with this Regulation, the Ministry requires that personnel driving on an active logging road (as defined in Article 26.83 above) are required to monitor the frequency of the logging

operator in the area. In addition to announcing 'Position' and 'Branch of the road being traveled' the Ministry also requires 'Direction of Travel' be announced.

To ensure compliance, the road channel must be monitored at all times while on the logging road except while stopped off the road in a 'pull-out' area.

The road frequency must be posted at the base of the logging road or at the entrance to the logging area. If the logging road you access does not have the logging road frequency clearly posted, you are requested to inform the Ministry's District Office of the details.

## APPENDIX B - SAFETY REQUIREMENTS FOR FIELD STAFF:

(Worker's Well Being)

> Personnel operating vehicles on logging roads must have their vehicle equipped with a mobile radio programmed with the required logging channels for the area in which they are operating.
>
> For safety purposes, handheld portable radios must not to be used for road channel communications on logging roads.

### WORKERS' COMPENSATION BOARD REQUIREMENTS

***WCB: Accident Prevention Regulations: - Article 8.32***

> **Workers Working Alone – Checking worker's well-being**
>
> **Where a worker is employed under conditions which present a significant hazard of disabling injury, and when the worker might not be able to secure assistance in the event of injury or other misfortunes, the employer shall provide a means of periodically checking the well-being of the worker. Checks shall be made at such intervals and by such means as are appropriate to the nature, hazard and circumstances of the employment.**

The current Forest Service procedure is for four (4) check-ins per day at two hour intervals. For aircraft the check-in period is reduced to every 30 minutes. (**Note** Check with the specific District and Fire Control Centre to obtain local area check-in procedures).

District Office Obligations:

Normal office hours for District Offices may vary. It is important that you establish and check the work hours for the District in which you will be working. If you are required to work outside these normal office hours, ensure you have established and

confirmed a check-in procedure with your supervisor and that you have advised the District Office. The District Office should be advised of your Call-Sign.

***WCB First Aid Regulations: - Article 33.5 (1)***

> There shall be an effective means of communication between the location of the First Aid Attendant and the work areas served.

Ask your work group leader, fire boss or supervisor about the procedure and how to test this communications link. BCFS radios are an effective method of providing communications to ensure the well-being of persons working in isolation.

## APPENDIX C

### BC FOREST SERVICE FREQUENCIES

STANDARD RADIO CHANNEL LINE-UP
(For the ICOM F3 / F3s, F30GT Handhelds and ALL Mobile Units)
(Revised: January 2004)

**Portable and Mobile Frequency Line-up:**

| Position | Colour | Transmit | Receive |
|---|---|---|---|
| *Bank 1:* | | | |
| Channel 1 | | | |
| Channel 2 | | | |
| Channel 3 | | | |
| Channel 4 | | | |
| Channel 5 | | | |
| Channel 6 | | | |
| Channel 7 | | | |
| Channel 8 | | | |
| Channel 9 | | | |
| Channel 10 | | | |
| Channel 11 | | | |
| Channel 12 | | | |
| Channel 13 | | | |
| Channel 14 | | | |
| Channel 15 | | | |
| Channel 16 | | | |
| *Bank 2:* | | | |
| Channel 1 / 17 | | | |
| Channel 2 / 18 | | | |
| Channel 3 / 19 | | | |

| | | | |
|---|---|---|---|
| Channel 4 / 20 | | | |
| Channel 5 / 21 | | | |
| Channel 6 / 22 | | | |
| Channel 7 / 23 | Primary Use Reserved for Future Applications | Secondary Use: User Defined | Secondary Use: User Defined |
| Channel 8 / 24 | Primary Use Reserved for Future Applications | Secondary Use: User Defined | Secondary Use: User Defined |
| Channel 9 / 25 | Primary Use Reserved for Future Applications | Secondary Use: User Defined | Secondary Use: User Defined |
| Channel 10-32 and Up (Mobiles) | | User Defined | User Defined |

**** NEW FOR 2004/2005 ****

**F30GT Handheld and the Kenwood TK780 – Incident Commanders and Fire Bosses Only:**

| Position | Purpose | Transmit | Receive |
|---|---|---|---|
| *Bank 16:* | | | |
| Channel 1 | Fire Commissioner's Simplex | | |
| Channel 2 | Link with the Fire Commissioner's Repeater | | |
| **Note:** Channel 2 requires Tone 9 encode/decode (192.8 Hz) to communicate with the repeater. | | | |

**UHF Fire Repeater Frequencies:**

| Repeater Type | Handheld Transmit | Handheld Receive |
|---|---|---|
| Type "A" UHF alpha | | |
| Type "A" UHF bravo | | |

**VHF AM Air Frequencies:**
(Air to ground— Fire or emergency use only)

| Air-to-Ground | Transmit | Receive |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

## CTCSS TONES: (Accessing District Repeater Channels)

The following tones need to be enabled in your mobile or handheld unit for you to access a District repeater system.

| Tone | Frequency |
|---|---|
| 1 | 114.8 Hz |
| 2 | 123.0 Hz |
| 3 | 131.8 Hz |
| 4 | 141.3 Hz |
| 5 | 151.4 Hz |
| 6 | 162.2 Hz |
| 7 | 173.8 Hz |
| 8* | 100.0 Hz |
| 9 | 192.8 Hz |
| **Note *:** To be phase out in 2005 | |

***Important***:

Tone 8 is for emergency purposes only. District tones must be used for normal or non-emergency communications. This includes aircraft.

Tone 8 is a provincial emergency access tone (encode only) and allows personal who roam (move around the province) to access a repeater system without having to know the specific tone of a district repeater. For 2004, its' use shall be restricted to those requiring roaming access in fire situations.

Caution must be exercised as this tone can activate repeaters (on the same frequency) in other Districts and Regions far removed from your area of operation.

Tone 8 will be removed in 2005.

# APPENDIX D - STANDARD OPERATING PROCEDURES:

## GENERAL INFORMATION

Most of the radios used by BCFS are either VHF (very high frequency) or UHF (ultra high frequency). The radio you use is capable of communicating from a few hundred feet to many kilometres.

> **CAUTION: Do not** use a radio without an antenna attached. Do not hold a radio by it's antenna.

Your ability to communicate is impacted by factors such as:

- Are you line-of-sight with the person with whom you are trying to communicate;
- Are there trees, foliage, rocks or hills between you and the intended receiver (Obstructions do reduce the effectiveness of radios to communicate);
- Are you in a gully or on a higher knoll (The higher your elevation (and your radio) the better success you will have in communicating with others or with a repeater system);

If you are at the end of a District's repeater system you may experience up to a ½ second delay as the entire district repeater system turns on. Speaking to soon before the entire system has turned on may result in the first ½ second of your message being lost. In these situations hold the mic button down for ½ second before you begin speaking.

Antenna location is important:

- If you have the radio on your belt or in a chest pack, your body will absorb some of the signal which will limit the radio's effectiveness. Try holding the radio up and away from your body.
- Are you holding your radio horizontal or vertical (i.e. Is your antenna horizontal or vertical.). The BCFS radio system uses vertical polarization for person-to-person communications - holding your radio sideways with the antenna horizontal will reduce your ability to communicate effectively;

Once you have established contact keep the radio in that location until you are finished your conversation.

Remember, hearing a voice transmission does not guarantee that you will be able to talk with the other person.

Vehicle mobiles have more output power than a handheld radio and also better antenna systems giving them improved chances of providing you with successful communications.

## DISTRICT RADIO REPEATER SYSTEMS:

### *Description and Operation*

A radio repeater receives a radio signal and re-transmits that signal.

Most BCFS mountain-top repeaters are UHF between mountains, UHF to VHF on drop link repeaters and VHF to VHF for localized or fire repeaters.

### *Propagation Characteristics*

- UHF signals require close to line-of-sight operation, more-so than VHF signals which are at lower frequencies;
- Radio signals will bounce of rock faces or large surfaces;
- VHF signals, being lower in frequency, have better foliage penetration and refraction capabilities than UHF signals. This allows their coverage to increase beyond the physical line of sight; (See the following diagrams)

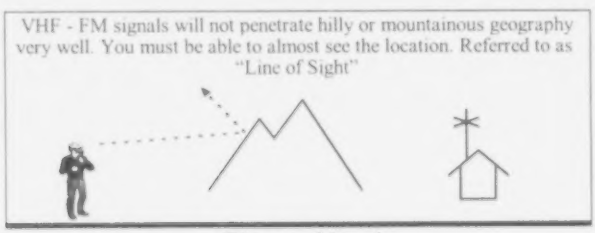

VHF - FM signals will not penetrate hilly or mountainous geography very well. You must be able to almost see the location. Referred to as "Line of Sight"

Figure No. 1

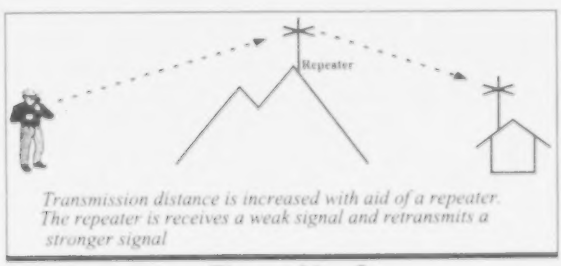

Repeater
Transmission distance is increased with aid of a repeater. The repeater is receives a weak signal and retransmits a stronger signal

Figure No. 2

Radio coverage from a transmitter mounted at a District Office could cover five to thirty kilometres depending on the surrounding terrain and the height of the transmit antenna.

To extend the coverage to work areas further away a single repeater may be incorporated. When the distance is too great for a single repeater more repeaters are added. By establishing a series of repeater sites, radio coverage can be extended over a large area.

The Ministry of Forests identifies its various repeater channels by colours. For example, a red channel is the same in the Northern

Interior Forest Region as it is in the Southern Interior Forest Region. Refer to Appendix A for the colour and tone charts.

***Repeater Example:***

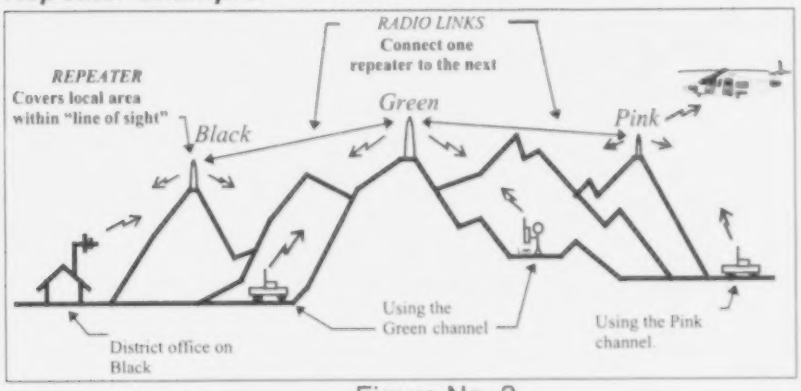



Figure No. 3

***How a District Repeater System Works***

THE PROCESS:

The District Office transmits (or calls out) on Black.

This is received by the BLACK Repeater which:
- retransmits the signal on BLACK; and,
- transmits the signal to the GREEN Repeater on an UHF link channel.

The GREEN Repeater Transmits the signal on GREEN to:
- the portable (right of the GREEN Repeater);
- the (left) vehicle (left of the GREEN Repeater);
- the PINK Repeater on another UHF link channel.

The PINK Repeater receives the signal from the GREEN Repeater and:
- transmits the signal on PINK to the (right) vehicle; and,
- transmits to the helicopter.

**NOTES:** 1) Your radio must be on the correct channel to communicate. If you are operating into a District repeater system, you must also be on the correct District tone (Check the District map or with District Office staff if you are uncertain.).

2) Mobiles, portables and aircraft should use the nearest repeater channel to their present location.

To call the District Office back from the Portable:

The portable transmits on the GREEN. The signal travels up to the GREEN Repeater which:
- sends a signal down to the (left) vehicle on the GREEN channel;
- links to the BLACK Repeater on the first link channel; and,
- links to the PINK Repeater on the second link channel.

The BLACK Repeater:
- transmits a signal on BLACK that will be received by the District Office.

The PINK Repeater:
- transmits a signal on PINK that will be received by the (right) vehicle and the helicopter.

In summary:

When any radio in a District transmits and is heard on one repeater, all the repeaters in the radio system retransmit the signal, each on its own colour channel.

Staff wishing to communicate and not use the repeater system must be in close proximity to each other or within or near line-of-sight. In this case they would move to a simplex channel (Gold, Silver, Copper, Bronze or Nickel) and communicate directly. If this fails, then the repeater system must then be used for communications.

Exceptions:

Some districts have the ability to split their systems into two or more localized systems for fire management or District administrative purposes. In these situations you will only communicate with repeaters and staff operating in your portion of the separated repeater system.

An example of difficult or marginal communications:

If the portable is too far away, it may hear the repeater but not be able to talk to it – possibly due to the inherent low gains of portable antennas, a poor location or possibly an incorrect antenna polarization. In this example the portable would hear all the traffic on the channel but not be able to talk to anyone.

**TERMINOLOGY:**

***Simplex Frequency:***

A single one-way radio channel. Your radio transmits a signal and receives a signal on the same frequency – but only one way at a time. Push the Mic button to talk – release it to listen. An example is the BCFS 'GOLD' channel, which transmits and receives on 163.830 MHz.

***Half-duplex Frequency:***

A 2-frequency system where you transmit and receive on separate frequencies - it is not possible to talk and listen at the same time. An example is the BCFS 'Red' channel which transmits on 163.065 MHz and receives on 163.935 MHz

***Full Duplex Frequency:***

A 2-frequency system where you transmit and receive on separate frequencies. A duplexer is used allowing each user to talk and listen at the same time. An example is a Telus Autotel channel, which allows you to talk and listen at the same time.

***VHF and UHF Frequencies:***

Ministry of Forests VHF (Very High Frequencies) frequencies operate in the 150 MHz – 170 MHz band and UHF (Ultra High Frequencies) operate in the 400 MHz – 470 MHz band.

**CALL LETTERS and CALL SIGNS:**

It is against the law to transmit an unidentified signal. The full call sign must be given when establishing contact and when signing off.

***Call signs are issued by the Districts and Regions for their staff, by Protection for their staff and by the Victoria radio shop for Branch staff.***

A new '*Final Draft Call-Sign Plan*' is now available for implementation. Where possible this plan should be followed when issuing Call Signs.

**STANDARD PHRASES:**

When speaking on the radio, certain words and phrases have become standard. To avoid ambiguity and confusion, the following should be learned and used:

| | |
|---|---|
| *ACKNOWLEDGE* | Let me know that you have received and understood this message. |
| *AFFIRMATIVE* | YES - permission granted. |
| *CLEAR* | No further transmission from this station. Where possible this should be preceded by the call sign of the speaking person (i.e. '*BRAVO FOUR CLEAR*') |
| *CORRECTION* | An error has been made in the previous message. The correct version is... *(Provide corrected version).* |
| *GO AHEAD* | Continue - proceed with your message. |
| *NEGATIVE* | NO - permission not granted or NO I do not agree. |
| *SAY AGAIN* | Please re-say your last transmission |
| *RADIO CHECK* | Please tell me how you clearly you understand what I am saying. |
| *ROGER or COPY* | I have received and understand all of your last transmission. |

| | |
|---|---|
| *ROGER - OUT* | I have received and understand all of your last transmission and I have no need to communicate further at this time. |
| *STANDBY* | I am busy for a moment. Please wait and listen to the radio until I can get back to you.<br>If more than one person is waiting it is a common practice to also use their name or call sign (i.e. 'STANDBY John' or 'STANDBY Bravo 4', etc.) |
| *STANDING BY* | I have received your message to wait and will wait silently until you get back to me. |
| *Call Sign – OUT* | *(Give your call sign and say the word 'OUT')* My conversation has ended and no further response is expected. |
| *OVER* | My transmission is ended and I expect a response from you. |

**THE PHONETIC ALPHABET:**

When a word is to be spelled, use the standard radio phonetic alphabet:

| | | | |
|---|---|---|---|
| A - Alpha | H - Hotel | O - Oscar | V - Victor |
| B - Bravo | I - India | P - Papa | W - Whiskey |
| C - Charlie | J - Juliet | Q - Quebec | X - X-ray |
| D - Delta | K - Kilo | R - Romeo | Y - Yankee |
| E - Echo | L - Lima | S - Sierra | Z - Zulu |
| F - Fox-trot | M - Mike | T - Tango | |
| G - Golf | N - November | U - Uniform | |

Judgment is required in the use of the phonetic alphabet. In noisy or hard to understand communications link use of this alphabet can improve the speed of communications eliminating the need for repeats. Where communications is clear the use of the phonetic alphabet can slow the message down as the alphabet use is not necessary to understand the message.

In transmitting numerals clarity improves when certain syllables of some numbers are emphasized. Those requiring special emphasis and articulation are as follows:

4 – FOWer; 5 – FIFe; 7– SEVen 9 – NINer (with emphasis on capitals)

**Sign In/Out (District Offices or Fire Control Centre):**

***District Office Staff:***

Each District Office has individual sign in/out procedures and it is

the responsibility of an employee traveling off highway in a district to be aware of and abide by the procedures for the district in which he/she is traveling. *For detailed protocols see Appendix J.* District staff must be familiar with the procedures for their own district. If District staff plan to travel off highway in a District that is not their own they must secure a copy of the procedures for the District in which they will be operating - prior to embarking on the trip.

**Note:** Normal hours of work may vary from district office to district office. Ensure you confirm your location and make check-out arrangements prior to the District's formal closing time.

***Protection Branch Staff:***

Protection staff may alternately check-in with the 'Fire Control Centre' during fire season as an alternate to a district office check-in.

***Regional Staff and Headquarters Branch Staff:***

Regional and HQ Branch staff must follow the same procedures when traveling off pavement in any District. Make sure you check yourself in with the District Office.

***Check-in Examples:***

Example 1: You are from a Region or HQ office and are establishing communications with the Port Alberni Forest District office.

You initiate the communications:

XLT40 Port Alberni, *(Give your pre-assigned Call Sign such as 2Bravo4 or 7Romeo32 or 'Car 9').*

Port Alberni Responds:

Car 9 - XLT 40 - Go Ahead.

This is *"(Give your name)"* from *(Give your Branch name and your headquarters or regional location).*

My destination (or area of work) is *(Provide Location).*

I will be in the area until (specify time using 24 hour clock)

I will check back at *(specify time using 24 hour clock).*

***Remember*** there is a two hour maximum time check-in if you are working alone.

Alberni Responds:

Roger Car 9 – XLT 40 Alberni Clear.

Example 2: Coastal Fire Centre calls Port Alberni Office:

"XLT 40 Port Alberni – VDI 758 Coastal Fire Centre".

Alberni Responds:

VDI 758 Coastal Fire Centre - XLT 40 Go Ahead.

Example 3: Kalum District Office tries to call mobile 2Bravo4:

2Bravo4 - XLV 67 Kalum *(pauses 10 seconds-no response)*

2Bravo4 - XLV 67 Kalum
2Bravo4 hears the call:
XLV67 Kalum – 2Bravo4 - Go Ahead

Example 4: 100 Mile District Office calls Timothy Lookout:
XMJ 88 Timothy Lookout - XLY 22 100 Mile.

Stations constantly working together and expecting calls at any time may drop the location name (i.e. XMJ 88 or XLY 22).

**Note:** 1) The correct order of called and calling station must always be maintained.

2) When the stations involved are capable of multi-channel operation; the transmitting station must also indicate the channel it will be using.

Example 1: 7Romeo32 wants to communicate to the District on yellow.
XLZ 63 Queen Charlottes—7Romeo32 on yellow

## APPENDIX E

## OTHER COMMUNICATIONS EQUIPMENT

### Other Mobile Features:

***DTMF "Dual Tone Multi Frequency"***

DTMF also known as "Touch Tone", are the tones that you hear when you dial a push button phone. Some District repeater systems can be divided into two or more separate repeater systems by sending the correct DTMF tone sequence to them. When repeaters are separated in this manner each operates independently and conversations on one subsystem will not be heard on the other(s), allowing for greater repeater utilization.

**Note:** There is an administrative procedure to follow prior to splitting a District repeater system.

***Telephone Interconnect***

Some District offices have "Telephone Interconnects" which allow a mobile or portable user to make telephone calls over the radio system. This is accessed by sending a specific DTMF tone or tones to "turn on" the interconnect. Access codes may be obtained from the District office or Regional radio technician. There may be some restrictions imposed by the District Office on the use of this feature – check with the local District Office.

**MobilTel:**

This is a common carrier (i.e. Telus) offering which provides telephone interconnect into the public switched telephone network (PSTN). It is the predecessor of AutoTel and operates in the 150 – 160 MHz band. MobilTel provides less coverage than that provided by the BCFS system. It is a manual system and requires that you push and hold the Mic PTT button for approximately 5 seconds to activate the call. After 5 seconds you will get a ringing and eventually a MobilTel operator in Vancouver who will place your call.

**Note:** You are required to have an active account with Telus prior to using this system.

**AutoTel:**

AutoTel is the predecessor of Cellular Phone Service. Unlike 'Cell Phone' service, AutoTel operates in the 150 – 170 MHz band and so provides radio coverage from their remote sites similar to the way the BCFS radio system does. AutoTel provides PSTN interconnect without an operator, mainly along highways and population centres. While not as versatile and transparent as cellular it is available over a much greater area.

**Note:** To access the AutoTel system you require a dedicated AutoTel specific radio, and an account with Telus Mobility.

**Globalstar Handheld Phones.**

The Globalstar phone, while similar to a large cell phone, has certain operating characteristics, which must be taken into consideration. Please read the operator's handbook that comes with each phone and which fully explains the unit's operation (with or without the built in cell phone being activated).

Things to consider when using the phone in satellite mode:

The Globalstar handheld has two positions (left or right) for the antenna depending upon whether the user is right or left handed. Ensure the antenna is in a near to vertical position when setting up your call.

The phone's antenna has to be able to see a large percentage of the sky. This need negates using the unit inside a building or vehicle unless some sort of remote antenna is used (i.e. car kit for a vehicle). This also makes it difficult to use the phone under heavy canopy.

The phone can be used in less than the ideal "clear sky" conditions, but the user will encounter problems with the call dropping out, or with distorted audio. The more of the sky that can

be seen, the more likely it is that a clear, continuous call can be completed.

Globalstar Options:

1) Car Kits are available with external antennas for vehicles use,
2) A Base/Fixed unit version of the phone is available for remote location in building installations.

## APPENDIX F - WHERE TO GET HELP

**NOTE:** Locations are detailed inside the front cover.

### Regional Radio Electronic Shops:

Please check the quick reference page inside the front cover for the locations of the nearest Radio Shop.

Radio Electronics Shops provide the following services for you:

- Information on the Ministry of Forests radio system;
- Training;
- Radio repeater maps;
- Instructions on how to obtain a Handheld or Mobile radio;
- Call-Signs;
- Radio repair, reprogramming or maintenance;
- The addition and removal of channels from your radio;
- Information on radio communications between Regions;
- Evaluations of specific radio or communication requirements;
- Repair and maintenance of the ministry's repeater system;
- Provision of radio equipment for forest fires;
- Provision of a fire repeater;
- Provision of Fire Stock Handhelds for fire line communications;
- Instructions on how to obtain a Globalstar handheld radio;
- Fire Camp and Fire Communications (PETUNIA) set-up;

### Headquarters Support:

The Victoria Radio Shop is located in Victoria. Please check the quick reference page inside the front cover for Radio Technician contact information.

The Ministry of Forests Radio Operations Intranet Home page:

http://gww.for.gov.bc.ca/his/radio/index.htm

The Radio Shop in Victoria is the prime repository for spares for repeaters, fire repeaters, base stations, and fire stock handhelds. Equipment kept on site is as follows:

- Regional Radio Repeater Spares;
- Type A1 and Type A2 fire repeaters;
- Type A1 and Type A2 fire repeaters with link capability;
- Type B fire repeaters;
- 2 Fire Commissioner's Transportable Fire Repeaters;
- Globalstar to VHF repeater;
- PETUNIA (MoF Trailer - Radio Communications System);
- Fire Stock radios for fire-line use;
- Spare AM, Mobiles, Handheld radios and paging system;

Services Provided By Radio Operations - Victoria:

- District Repeater System Maps (By Region);
- Letters of Authority (to others using the MoF radio System);
- Fire stock repair and maintenance;
- Fire repeater maintenance and repair;
- Repair and maintenance of Fire Commissioner's repeaters;
- Radio Licensing;
- Radio Repeater Maps
- Radio System Design – Coverage and Link path profiles;
- Communication Field Handbook;
- Radio Training materials;
- Coordination with other emergency agencies;

***Protection Fire Control Centre (Fire season only)***

A new Fire Radio Communications Plan (FRCP) is being implemented for the 2004 Fire Season. The FRCP outlines the new processes, policies and procedures being implemented to ensure fires have adequate radio communications when Incident Command teams are put in place for both interface and Level 1 and Level 2 fires.

Requests for a radio technician or radio communications equipment should follow the FRCP.

Radio communication problems should be routed through to the Provincial Fire Control Centre (250-387-1717), to the nearest Fire Centre, to a Regional Radio Supervisor / Radio Technician, or through to Radio Operations in Victoria.

Radio equipment requests or work which will result in Fire Overtime require the approval of the Fire Control Officer. This should be completed when requesting assistance of Regional or Headquarters Radio staff.

# APPENDIX G

## Knowing More about your Radio:

### *Squelch Control:*

The purpose of the squelch control is to quiet the noise that radios generate when not receiving a signal.

All BCFS radios have a squelch control however this control is not always accessible to the operator. Those radios with internal squelch control will have been pre-set by a radio technician. Some manufacturers combine the 'on/off switch, squelch control and the volume control as one switch.

### *PTT (Push-to-talk) Button:*

The PTT button is depressed when you wish to transmit a message to another user. The button is located on the side of the handheld radio or if you have a remote Mic, it is located at the end of a coiled cord on the side of the microphone.

### *Monitor Button:*

Some radios have a "Monitor" button or switch that will disable the receiver tone coding function (CTCSS) (See Section). On some radios this function will disable the squelch, allowing the speaker to generate a loud hiss or 'roar'.

### *Channel Selector or Key Pad:*

Channel selection on most radios is with either a numbered rotary switch or with an up/down arrow – the channel being displayed on the front screen.

Some radios have a key pad for channel or the frequency (if enabled) selection. On the keypad, press the channel number(s) then "enter" to select a channel.

### *Antennas:*

The antenna radiates power (a radio signal) into the air – without it your radio will be unable to properly transmit or receive and your message will not be heard. Radio signals, like visible light, can be polarized. Mobile communications uses vertical polarization - therefore the antenna on the radio needs to be in a near vertical position for best communications.

Antennas have a specified length which correlates to the wavelength used for communications. Antenna lengths should only be altered by qualified radio technicians. Telescopic antennas should be used in extended mode (length is critical). Care must also be given to avoid damage to the antenna connector.

Contact the Superintendent of Electronics or a BCFS Radio Technician for more information regarding various antenna options.

**Important:**

- Never hold your radio by the antenna;
- Do not transmit if there is no antenna on the radio;

***Hi – Lo Power Switch:***

Some radios have a Hi-Lo Power switch which changes the output power of the unit. The 'Lo' position should be used when communicating in close proximity to another receiver. The 'Hi' position should be used to extend the transmission range. Using the 'Hi' position will greatly reduce battery life.

***Batteries:***

Hand held radios may also use rechargeable Ni-cad batteries. These should be recharged after four to eight hours of use. An AC charger is supplied with each unit and in-vehicle chargers are available. If you have no charger, batteries can be removed and sent in to the local BCFS radio shop for a charge.

Ni-Cad batteries can develop a memory which will prevent a user from getting a complete charge and full benefit from the battery. These units should be cycled in an appropriate charger/re-conditioner every year to remove any residual memory.

Instructions for the removal of batteries vary somewhat from one unit to another but most unclip at the back.

**Important**:

- NI-CAD batteries are not to be discarded in the garbage but are to be given to your Radio Technician;
- Return defective batteries to your Radio Technician.

Leaking Batteries:

Remove all batteries in a pack, even if only one has leaked.

If you are unable to return the unit to the nearest radio shop then:

- Completely disassemble the battery holder and/or compartment;
- Wash with baking soda and water (or CLR cleaner), brush and remove loose corrosion;
- Sand and clean all corroded metal;
- Wash and dry the unit;
- Install new batteries and tag the unit for investigation of continuing damage

If leaking cells are found in a Portable and you do not have a replacement battery pack: Clean as above - otherwise replace it with a new pack and return the damaged one to a radio shop.

Vehicle Power Supplies:

All vehicle mobile radios run off your vehicle battery and are protected by an in-line fuse on the positive (red) wire.

Power to a vehicle radios may or may not be routed through the ignition switch of the vehicle – you should know whether your vehicle is or is not powered through the ignition switch. To check, turn your ignition off; if you can still talk on and listen to your radio the ignition switch has been bypassed. This will allow you to monitor the radio system without having the keys in the ignition. Leaving the radio on will drain the battery in 8 to 72 hours depending on the radio, your battery condition and the outside air temperature.

**Important**:

- If your mobile unit is not wired through the ignition switch, it is a good habit to shut off the radio when you leave the vehicle for an extended period of time.

Trunk Mounted Units:

The physical radio will be located in the trunk or under/behind the seat. A control head will be mounted in the vehicle dash area.

Fused battery leads run to both the control head and to the radio mounted in the trunk / seat area.

**Field Notes:**

## APPENDIX H - Maps

**Obtaining Maps:**

Options:

- Six separate colour Regional maps; and/or,
- Three double-sided versions of the same maps; and/or,
- A plastic coated version for outdoors use (They do not fold very well);

Copies may be obtained from Regional Electronics staff or ordered directly from the Copy Centre in Victoria (Phone: 250-387-6045). Also available off the Web: http://gww.for.gov.bc.ca/his/radio/index.htm

**Note:** The full Province-wide map is no longer available.